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Projected dry weather limits tillage options

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Abstract
Last fall's dry weather came late enough to have only a small effect on 1999 crops, but according to Iowa State University Agricultural Meteorology Professor Elwynn Taylor, the available subsoil moisture was largely depleted by the end of the growing season. Taylor says that two-thirds of the state of Iowa entered winter with well below normal subsoil moisture, and only the eastern one-quarter of the state has recovered to near normal subsoil moisture, whereas western Iowa remains in a soil moisture drought.

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Even though overwinter conditions are usually fairly dry (and they were even drier than normal this winter), the warm conditions of the past winter allowed essentially all of the seasonal precipitation to infiltrate the unfrozen soil. Although normal precipitation in June would be sufficient to correct the conditions statewide, the long-range outlook from the National Weather Service indicates that this spring may be warmer and drier than usual.

Planning for dry weather may be one of the key management challenges producers face this season. Adequate water is especially important at planting time. Without sufficient topsoil moisture, seed germination could be impaired, resulting in low plant populations and low yield. Drought also can cause increased insect infestation, plant disease, and wind erosion.

The dry spring we've experienced in 2000--including dry surface winds with low relative humidity, and lots of sunlight--means that conditions are right for additional moisture loss through normal spring tillage operations. If you've experienced insufficient precipitation since harvest, you should consider modifying your spring tillage management plans before heading out to the field. With modifications to your tillage management plan, the level of crop susceptibility (from emergence to maturity), can be partially managed with tillage, even in a dry year.

Conserving sufficient topsoil moisture for early growth can help the plant bypass deficiencies in subsoil moisture. Getting the crop off to a good start this year may be critical, especially if subsoil moisture is replenished later in the growing season.

If tillage also is used for herbicide incorporation, be certain of the label requirements and select herbicide and tillage timing accordingly. Don't till deeper or more times than needed for incorporation. If soil is dry, you may want to consider a postemergence weed management strategy that limits or avoids incorporating herbicide.

Choosing an appropriate spring-tillage operation in a potentially dry year depends on the type of tillage you performed last fall. If you've left the soil and crop residue undisturbed since harvest, you might find that the soil has retained some moisture in the top few inches, due to the barrier effect of crop residue against moisture loss.

Generally, spring tillage should be minimized to avoid loss of existing moisture in the soil. A single tillage pass can result in the loss of up to one-half inch of soil moisture or more, and deep tillage tends to let more soil aggregates be exposed to drying air conditions.

Also, even though some soils were observed to be "hard" last fall (as evidenced by increased tillage draft requirements), producers should recall that dryness causes soil to become hard. Dry conditions rather than compaction could easily increase tillage draft.

It also helps to know your soil. If you have soils with poor internal drainage, consider a light tillage pass with a field cultivator or disk just prior to planting. It will dry the surface enough to plant without causing undue moisture loss. If you manage soils with adequate internal drainage, no-till may offer the best management choice. Producers who lack recent no-till management experience should make sure their planter is properly maintained and adjusted and brush up on their pest and nutrient management planning.

Soils that received primary tillage last fall may need to be leveled with a secondary tillage operation before planting. Two strategies (early spring or just prior to planting) may be used to conserve soil moisture. If you choose early spring tillage, it should probably have been done by now or as soon as possible. With an early spring strategy, the soil is opened up for some drying, but any spring rain that does occur can readily infiltrate the soil. With the second strategy, the tillage and leveling operation is delayed until as close to planting time as possible. Using tillage just before planting preserves soil moisture present in the tilled depth and does not allow it to escape until the seed is planted.

Other issues to be concerned about when managing spring tillage include concerns about the limited frost action during the past winter. Although our warmer temperatures limited soil freezing, which helps break up compaction, most Iowa soils were dry enough during harvest that compaction was probably minimal.

It's also important in dry weather to be aware of the soil's ability to seal the crack left by ammonia knives and manure applicators.

Forecasting the weather is like rolling the dice. Why not save rolling the dice for the next time you're in Vegas, instead of taking a chance with your operation by betting on the wrong tillage options, if 2000 turns dry.

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